Peninsula Beach Sand Management Feasibility Study

Presented to Marine Advisory Commission

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Program Overview

- Evaluate current and past sand management practices and develop alternatives to better meet City and public needs
- Focus on:
  - Storm protection
  - Recreational uses
  - Reducing truck traffic and noise
  - Restoring water views
  - Cost management

Study Location

Technical Approach

- Review past studies to see what has been tried before and look for innovative solutions
- Develop hydrodynamic model of study area to better understand site
- Determine optimal beach width and profile
- Evaluate range of management alternatives
- Focus on implementability and long-term effectiveness of solution

Alternatives Considered

- Existing practices – relocate sand from west beach using front-loaders and trucks to east beach
- Alternative 1 – same approach as existing except relocate sand using hydraulic system instead of trucks
- Alternative 2 – same approach as Alternative 1 except first create wider beach using sediment dredged from Alamitos Bay entrance channel
- Alternative 3 – same approach as Alternative 2 except add physical structure to reduce shoreline erosion

Current Operations – Mechanical Backpassing

Current Operations

- Conducted up to 5 days per week
- Significant residential impacts
- Loss of recreational uses
- Costs more than $550K per year
- Successfully protects residences

Alternative 1 – Hydraulic Backpassing

Hydraulic Backpassing

- Use hydraulic pump to transport sand to placement area
- Eliminates truck traffic and noise
- Commercially available equipment
- Can be rapidly deployed when needed
- More cost effective after initial capital investment

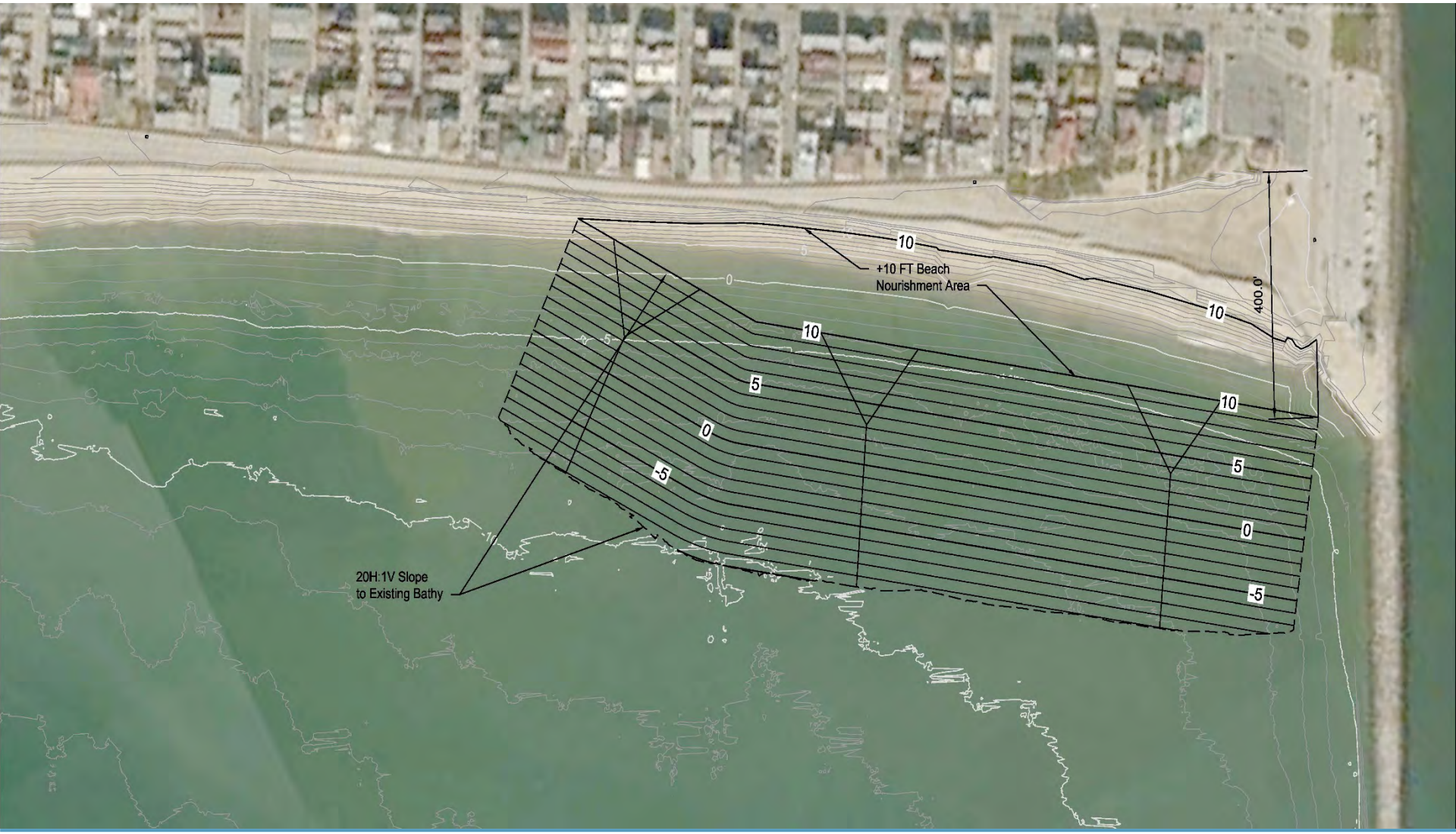
Hydraulic Backpassing

Alternative 2 – Hydraulic Backpassing with Initial Beach Fill

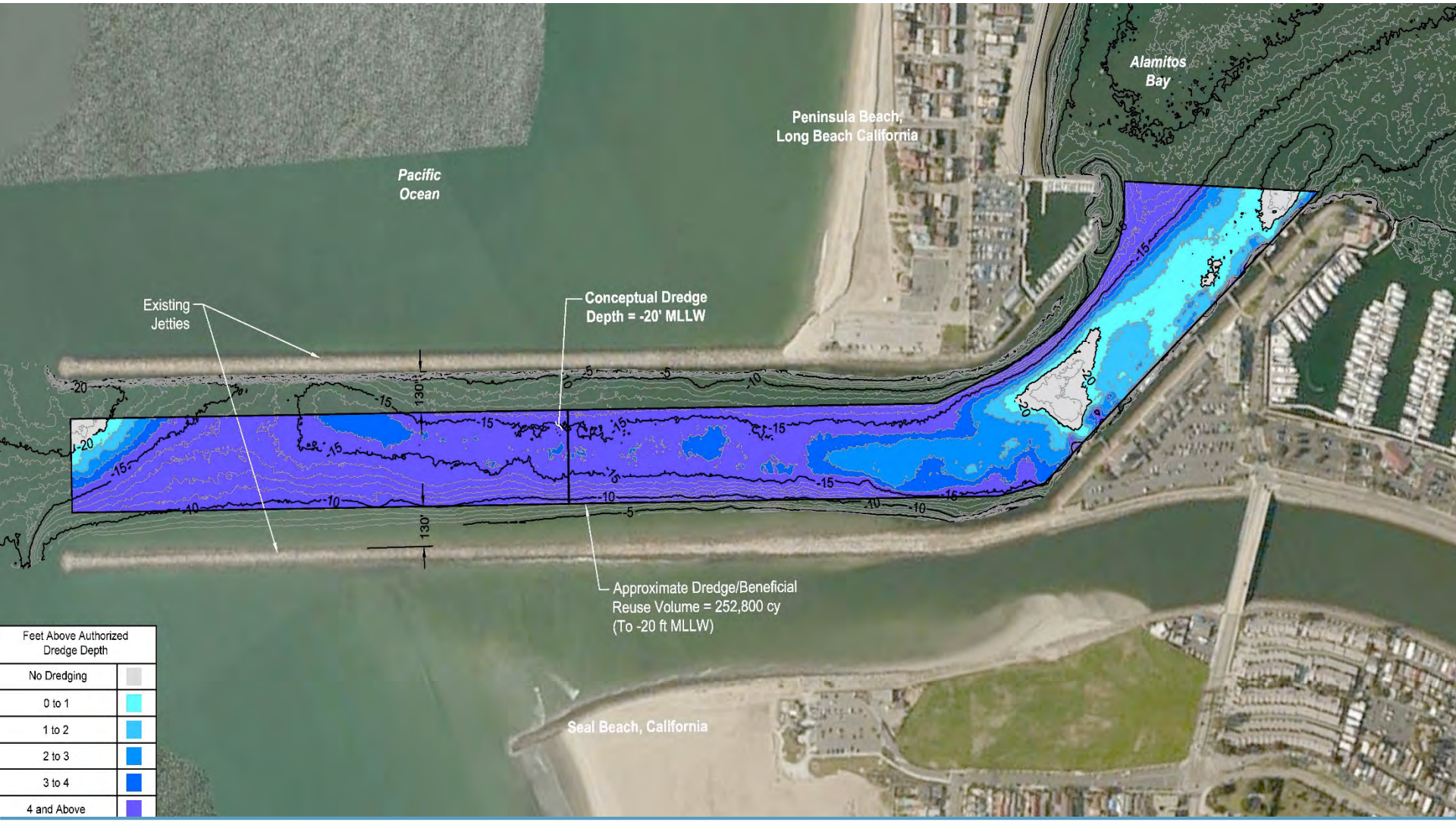
Hydraulic Backpassing with Initial Beach Fill

- Start with wider beach using entrance channel sand or other available sand
- Construct 200-foot-wide beach with gentle (20:1) slope similar to western end of beach
- Erosion and westward sand transport will continue
- Maintain outer edge of beach slope using hydraulic pump
- Provides shoreline protection and restores beneficial uses to beach

Target Beach Fill Area



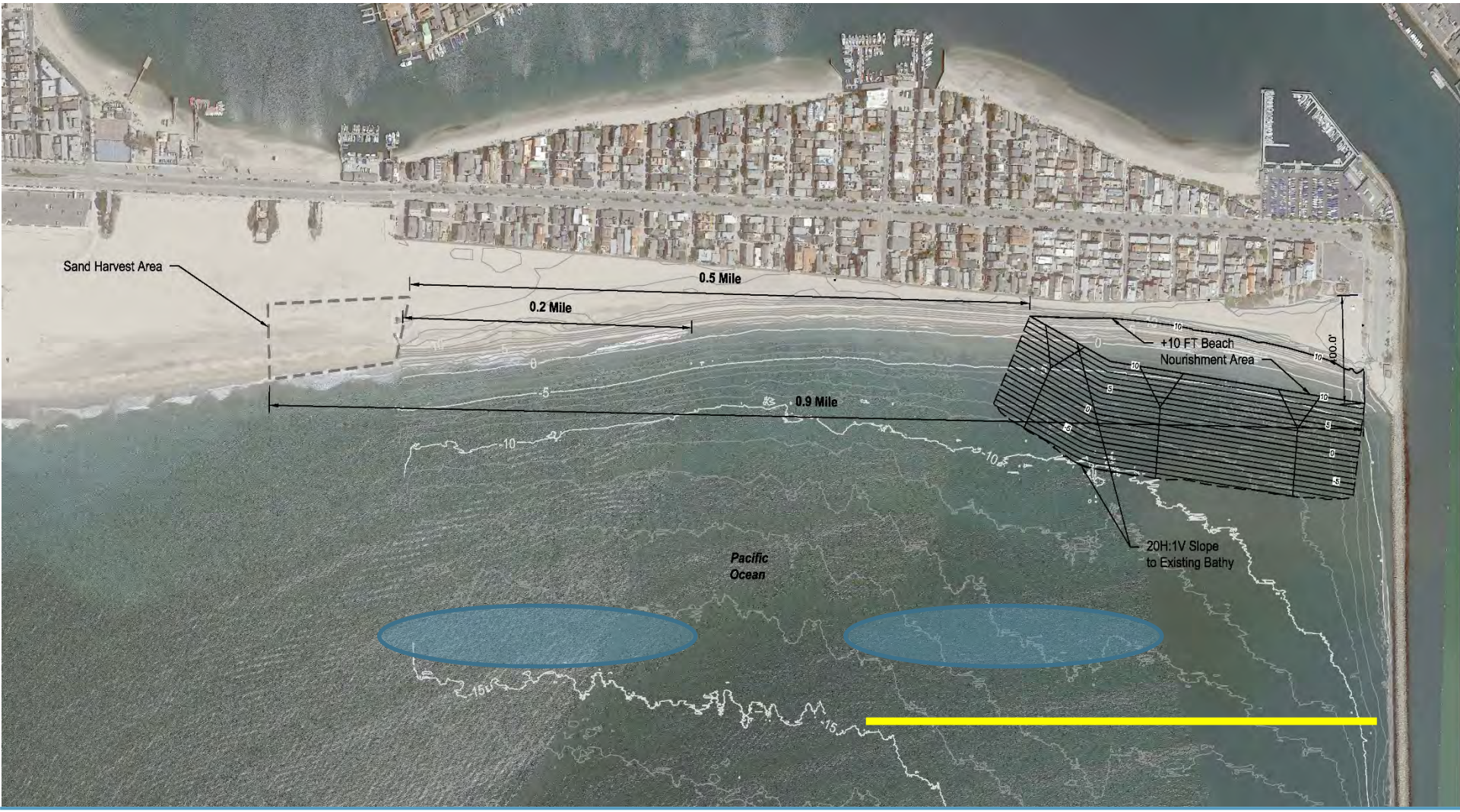
Available Sediment for Beach Fill



Alternative 2 Overall Approach

Alternative 3 – Hydraulic Backpassing with Initial Beach Fill and Physical Structure

Alternative 3 Potential Physical Structures



Cost Summary for Year 1

Cost Item	Current – Mechanical Backpassing	Alternative 1 – Hydraulic Backpassing	Alternative 2 – Hydraulic Backpassing with Initial Nourishment	Alternative 3 – Same as Alternative 2 with Structural Features Added
Capital Expenditures	--	$555,000	$555,000	$555,555
Rental Equipment	$300,000	--	--	--
Annual Maintenance	$30,000	$10,000	$10,000	$10,000
Annual Labor to Operate	$250,000	$125,000	$125,000	$125,000
Other O&M (dredging)	--	--	$4,050,000	$4,050,000
Other Capital Improvement	--	--	--	$12,500,000
Design/Permitting	--	--	$300,000	$400,000
Total	**$580,000**	**$690,000**	**$5,040,000**	**$17,640,555**

Cost Summary for Subsequent Years

Cost Item	Current – Mechanical Backpassing	Alternative 1 – Hydraulic Backpassing	Alternative 2 – Hydraulic Backpassing with Initial Nourishment	Alternative 3 – Same as Alternative 2 with Structural Features Added
Capital Expenditures	--	--	--	--
Rental Equipment	$300,000	--	--	--
Annual Maintenance	$30,000	$10,000	$10,000	$10,000
Annual Labor to Operate	$250,000	$125,000	$125,000	$125,000
Other O&M (dredging)	--	--	--	--
Other Capital Improvement	--	--	--	--
Design/Permitting	--	--	--	--
Total	**$580,000**	**$135,000**	**$135,000**	**$135,000**

Next Steps

- Purchase equipment for pilot study to test pumping efficiency
- Fine tune hydraulic pumping system and add equipment as necessary
- Begin transition from mechanical to hydraulic backpassing management approach

Questions/Discussion